

Automobiles, Farm Machinery and Farm Motors.

Lubrication of the Motor.

A few hundred feet or less, is the distance your automobile will travel without lubrication.

After that the pistons will bind, bearings will seize, engine will knock and finally come to a dead stop. It will go no further without lubricating oil.

The average motorist does not realize what the infinitely small oil film between metal surfaces saves him, until he faces the expense of renewing a burned out bearing. He does not appreciate why his engine stays young until he pays the repair man who has been treating it for scored cylinder walls.

His indifference to this subject arises almost entirely from his lack of information. Once he appreciates the importance of lubrication, he will see to it that his car is well supplied with an oil of high lubricating efficiency and correct body for his motor.

The parts requiring lubrication are the main shaft bearings, crank pin bearings, wrist pin bearings, cam shaft bearings, timing gears, cam, cam lifter guides and cylinder walls.

To determine the correct lubricating oil for the automobile engine requires both scientific study and broad practical experience. It necessitates consideration of the requirements of each make of car, involving the construction of the engine; horizontal, vertical or V type cylinder arrangement; two or four stroke cycle; bore and stroke; valve construction and location; oiling system; number and fit of piston rings; piston clearance; condition of bearings; cooling system (air or water); engine speed and climatic conditions.

The correct oil for the automobile engine is an oil:—

1. Of the highest lubricating efficiency.
2. Whose body and fluidity in cold weather are suited best to the feed requirements of the engine.
3. Of sufficient body and heat test to form a film that will separate the friction surfaces and prevent the escape of gases past the piston rings during the compression and power strokes.

If an oil of insufficient lubricating quality is used, scored cylinder walls may result. In this case the necessary oil film fails to form between the piston and the cylinder walls.

The piston rings then rub directly against the cylinder walls and, in time, the rings will break.

Scoring and scratching of the cylinders will result. Hissing of the motor will follow.

If an oil too light in body is used, it will work too freely past the piston rings and into the combustion chamber.

All petroleum lubricating oils are chemical combinations of hydrogen and carbon. By filtration the objectionable free carbon and other impurities are removed. It is impossible to remove the carbon, however, which is in combination with other chemical elements constituting an oil, without destroying the oil itself.

Consequently, when the oil works freely into the closed combustion chamber carbon deposit is bound to occur unless sufficient oxygen is present to cause complete combustion of the excess oil.

An unnecessary quantity of oil is consumed. Ignition trouble and, in time, knocking of the motor will result.

If an oil too light in body is used, it will form an insufficient film around the piston rings. If an oil too heavy in body is used, it will fail to spread freely, forming little or no oil film.

In either case, leakage of gases past the piston rings occurs on the compression and power strokes, with resultant loss of power.

The engine bearings differ widely in shape and size and are supplied by different oiling systems.

In determining the oil to be used for bearing lubrication, the requirements of the cylinders must be taken into consideration, as well as the close or free adjustment, of the bearings.

Bearings with close adjustment, being lubricated by a pressure oiling system, may use a medium or heavy bodied oil, as the pump pressure forces the oil, between the moving parts.

Bearings which are worn require a heavy bodied oil, which will fill the space between the journal and the bearing, and thus prevent knocking.

Two examples resulting from the use of an oil of poor quality or incorrect body, are worn main or connecting rod bearings and worn wrist pins.

Unnecessary wear of main or connecting rod bearings is caused by:

1. Poor quality of the oil.
2. An oil too light in body.

3. An oil too heavy in body to reach the friction surfaces.

4. An oil unsuited to the method employed for supplying it to the bearings.

This wear is indicated by a dull thump at every revolution of the main shaft.

Worn wrist pins will result from the same causes.

Their location within the heated pistons and the slight angular motion of the bushings demand an oil which will spread readily, yet maintain the proper film between the pins and bushings.

The effect of wear will be indicated by a clear metallic knocking.

The circulating oil system which is employed on a large percentage of the late engines is designed to hold the oil in the pump.

The oil is subjected to the heat of the crank case at all times and, as all oils decrease in body, or viscosity, under heat, it is necessary to select an oil having sufficient body, or viscosity, after being constantly subjected to this heat, to meet the lubricating requirements of the engine bearings and form a perfect piston seal.

In an air-cooled engine, the temperature of the cylinder walls is very much higher than in an engine that is water-cooled. This necessitates the use of a rich, heavy bodied oil, as the heat reduces the viscosity of the lubricant.

The value of an oil for winter use is not necessarily indicated by its cold test, i. e., its ability to flow freely at low temperature.

Low cold test oils are necessary only when the feed pipes are exposed to low temperature.

In determining the correct oil for winter use, the construction and feed system of the engine must be considered.

In cases, for example, where the oil feed pipes are so arranged as to get the benefit of the heat from the engine, low cold test oil is not required.

An oil may withstand low temperature and still not be the ideal lubricant. In fact, many such oils lack the proper lubricating quality.

The correct oil for winter use, aside from the exception noted above, must possess the characteristics previously outlined.

A. W. SULLIVAN.

Canada's Young Farmers and Future Leaders.

Preparing Exhibits for the Fair.

Many excellent products exhibited at fairs frequently do not receive the consideration at the hands of the judge that their quality deserves, simply because the exhibitor has not taken sufficient time and trouble to show them at their best. A sheaf may contain an excellent sample of grain, but if it is not made up in an attractive form, the good qualities of the exhibit will be lost upon those who attend the fair, even if the judges should discover them. The same thing holds true in the case of root crops, vegetables and fruits.

The work of preparing the material for exhibition is by far the most troublesome of anything in connection with making a display, but that it pays, if one is going to exhibit at all, to prepare the material carefully cannot be denied. Exhibits of grain in the sheaf are always very attractive and bring home to the visitor a more complete appreciation of the kind of crop represented by the exhibit. When wheat, oats or barley are to be exhibited in the sheaf they should be cut after beginning to turn yellow, but before complete ripening has taken place. This is to secure an elasticity of the straw which is necessary if the sheaves are to stand any amount of handling. A better appearance of the sheaf will be secured also if the straw is bleached for some days by exposure to the sun and to do this properly, sometimes as much as two weeks are necessary. The size of the sheaf is sometimes determined by the management of the exhibition, in which case it is well to conform as nearly as possible to the requirements they lay down. Generally speaking, one thousand heads will make a sheaf that will be approximately six inches in diameter just below the heads, while it will be nearly double this diameter at the butt. Sheaves three inches and five inches in diameter are required for some of the school fair exhibits, but the number of heads required can be easily figured out from the above. It is better if the straws are not all the same length. The longest straws should be in the centre, gradually shortening as the outside of the sheaf head is reached, so as to form a head of the best possible shape. Very large sheaves may be made most successfully by making them of a number of smaller ones, using each of the smaller ones as one would use individual straws for a smaller sheaf and finishing off the whole sheaf by putting one or two layers of individual straws around the outside. Where the grain is overripe and the straw brittle this method can be followed very successfully.

Tying is very important and each sheaf should be tied in at least three places while some kinds of grain, especially barley, will keep shape better if tied in four places. The appearance of the sheaf can be greatly heightened by using red or blue ribbon instead of binder-twine or ordinary string and the neater the knot can be made the more will it add to the appearance of the sheaf. The upper band should not be placed too close to the head; about four inches is the proper distance. The butt should be cut off squarely by laying the sheaf down

on a table or board and cutting it off a little at a time, beginning at the top. The band at the butt should then be about six inches from the butt. It should be remembered that in making sheaves, only straight straw should be used and the heads should be plump. Careful packing is also necessary when taking the sheaf to the exhibition.

Shelled grain, when exhibited, should above all things be uniform not only in the quantity shown but in the package and in the product itself. Shelled grain should be thoroughly ripe so that it will take on its best color and it should also be true to variety and free from weed seeds, dirt and other impurities. Sometimes seed intended for exhibition is hand picked, but this entails a lot of work. It is possible to get good samples by selecting the best part of the field free from smut weeds, etc., threshing this separately and after running the grain through a fanning mill, putting it through a vigorous cleaning with hand sieves.

Field roots such as mangels, sugar beets and turnips and vegetable roots such as carrots parsnips, etc., do not require so much care in their preparation as sheaves of grain but care is necessary nevertheless. In this class of product uniformity and smoothness are just as essential as in everything else and great care should be taken that the specimens selected are true to type for the variety and not too large. The importance of size is very often overrated with the result that quality, the most important single characteristic, must suffer. Size has some value, of course, and it is hardly necessary to add that the larger the specimens one can secure, providing quality is not sacrificed, the better. All roots should be firm, not spongy and the presence of prongs or an excess of fibrous roots will count against them. In any case the small rootlets at the tip should be removed and the tops should be removed as close as possible to the root, twisting the tops from mangels and sugar beets. Roots for exhibition should also be washed, but not scrubbed so as to peel off the skin or destroy the finish of the natural product. It is better to soak off the dirt and use a soft cloth, than to use a brush or do much rubbing. For trueness to type one can do no better than take as his guide the illustrations in one of the seed catalogues put out by a reliable firm.

In preparing vegetables for exhibition the essential thing to keep in mind is that the exhibits must be clean, true to type, healthy and must not show very much more of the plant than the edible part. Thus one does not exhibit the stems of onions, all the leaves of the cabbage or cauliflower or the stem of tomatoes. It is usual, however, to leave a few of the leaves of the cabbage and cauliflower since the heads are given a more natural appearance. Onions should be of good size, clean and have the tops removed to within about three quarters of an inch of the onion and the outer skin should also be taken off so as to give as clean an appearance as possible. Celery should be thoroughly cleaned and no small heads selected that show compactness and no small

spindly stalks or dead or spotted leaves. Tomatoes must be uniform, smooth, of medium size and true to type for the variety. Smoothness is one of the most important qualities in tomatoes, but this of course, will vary with the variety. Heads of cabbage and cauliflower must be well grown and as compact as possible. Trueness to type is very important with cabbage and cauliflower, since the various types are so much alike to the ordinary observer yet vary so much in their commercial value.

In preparing fruit for exhibition one must first be careful to select specimens that are free from injury or disease. Fruit is a luxury in one sense of the word and therefore appeals more or less to our aesthetic as well as our utilitarian tastes. Beauty is therefore looked for in the form of color and has its justification also in the fact that well colored fruits are also the ones possessing the most quality. Generally speaking, however, fruits are judged from the standpoint of their suitability for dessert or cooking and, therefore, these qualities should be given much attention. Size is relatively of little importance in fruits, except that very small specimens show too much waste from the core. The very best specimens of each variety will usually be found to be of little more than medium size for the variety. Excellence is determined, in most cases, by uniformity of the exhibit, color, trueness to variety and freedom from blemishes. Wormholes or scab spots are serious defects as are even individual specimens of San José Scale on a plate. The stems should not be removed, as this detracts from the keeping quality of the fruit and, wherever possible, the bloom of the fruit should be preserved as naturally as possible. The fruit may be wiped with a soft cloth if it should become soiled, but on no account should it be rubbed so that it shines, notwithstanding the fact that it can be made to appear much more beautiful and handsome by so doing. Much can be done to attract the eye of the judge by a careful selection of the plates on which the fruit is to be placed during the fair. Green, or yellow, or even red tissue paper tastefully arranged underneath the fruit will do much to set off the exhibit and we have even seen it used to throw into shadow a minor defect in one of the specimens on a plate. In the case of peaches particularly, the fruit should be as ripe as possible so that it appears most attractive. The same thing holds true with other fruits, but in any case it must not be so ripe that it will not stand up for a reasonable time without beginning to rot. The clusters of grapes must be as full as possible and true to the characteristic shape for the variety. Any defective berries in the cluster should be removed and sufficient of the stem left on to make it appear natural. What has been said about fruits in general with regard to the bloom, applies particularly to grapes as this adds considerably to the richness of the exhibit. Maturity, a healthy appearance, naturalness, cleanliness and trueness to type should be striven for in the preparation of any farm product for exhibition.